

AUS920010964US1

Patent Application

## Application for United States Patent

of

John Falk Kelley, *et al.*

for

5 "Ephemeral List for Object-Action Navigation"

## CROSS-REFERENCE TO RELATED APPLICATIONS

(CLAIMING BENEFIT UNDER 35 U.S.C. 120)

10 This patent application is related to US Patent Application serial number  
\_\_\_\_\_ (to be amended when serial number has been assigned), docket  
number AUS920010748US1, filed by John Falk Kelley, et al., filed on \_\_\_\_\_,  
2001, which is commonly assigned.

## FEDERALLY SPONSORED RESEARCH

15 AND DEVELOPMENT STATEMENT

This invention was not developed in conjunction with any Federally sponsored  
contract.

## MICROFICHE APPENDIX

20 Not applicable.

## INCORPORATION BY REFERENCE

The related patent application, US Patent Application serial number  
\_\_\_\_\_ (to be amended when serial number has been assigned), docket

number AUS920010748US1, filed by John Falk Kelley, et al., filed on \_\_\_\_\_,  
2001, is hereby incorporated by reference in its entirety including figures.

## BACKGROUND OF THE INVENTION

Field of the Invention

[0001] This invention relates to the arts of data management, searching, and summarization tools for networked computers and databases, and especially to user interface technologies for web browsers.

Background of the Invention

[0002] High-demand users such as investors, purchasing agents, sales people, and technical support staff, perform constant research online, via the Internet and other proprietary data networks and datafeeds. Current methods of delivering the multiplicity of information needed by these users usually involves a less-than-intuitive and confusing array of windows, pop-up boxes, and drop-down lists.

[0003] For example, a professional trader's daily activities in a "trading room" includes accessing, monitoring and analyzing many sources of information through a variety of means such as terminals, computers, and telephone lines.

[0004] One such trading room is the educational and model trading room operated by Massachusetts Institute of Technology's (MIT) Sloan Trading Room. In this simulated trading room, student "traders" may observe "tick-by-tick" price-volume data from such data sources as Reuters, Bridge, and Bloomberg for over 300,000 financial instruments.

[0005] A trader may also watch "data walls", such as those operated by Trans-Lux, and the trader may use an IPC Tradenet telephone network as needed. Each trader also typically has access to a personal computer ("PC"). All of these devices are

arranged on a trader desk or console where they can physically be monitored and operated by a trader throughout his or her work day.

[0006] So, through all of these means, a typical trader may try to monitor several datafeeds, such as Reuters and Bloomberg, as well as access databases of historical

5 information regarding various financial instruments and companies, such as the Center for Research in Securities Prices (CRSP) at the University of Chicago, and Standard and Poor's Compustat. Further, the trader may have access to analysts reports, such as I/B/E/S, from his or her PC. The PC itself is usually equipped with analytical and charting software, such as Leading Market Technologies' EXPO data visualization and  
10 analysis package, for processing and analyzing "raw" data received from the datafeed services. Additionally, the trader may use the PC and a browser to "check" or visit various web sites for news and information throughout the day and while making investment decisions.

[0007] This environment, though, can be overwhelming to the trader due to the  
15 amount of simultaneously displayed information, some of which is displayed in text format such as analysts' remarks, news stories, and ticker updates, and some of which is displayed graphically, such as historical charts, index trends, etc. All of these forms of information usually use color coding for highlighting of information or indicating other conditions related to the information.

20 [0008] The web browser has taken the forefront as the main tool in recent years, as many of these sources of information have transitioned from originating from proprietary sources and technologies to being available via the Internet. While this has

consolidated much of the information for access through a single instrument, the PC, it has increased the amount of manual operations necessary to "keep abreast" of the various sources of information, such as clicking and typing operations to jump from one web site to another.

5 [0009] Some "off the shelf" software packages have been developed to integrate and summarize some of this information into single screens of information. These, too, follow the user interface paradigm of a browser, typically, and usually do not allow for a great deal of customization as to the sources of information, priority of the updates, display arrangement, etc. Many such software packages have been adapted for  
10 non-professional use, such as use by "day traders".

[0010] The user interface paradigm typically is an "inverted-L" paradigm, wherein a user first selects a task or operation to be performed, such as selecting an analysis program to be run, and then must select an object on which to run the task, such as a block of data from a datafeed or database. This action may be preceded by a number  
15 of "navigation" operations to locate the task or program, as well as it may include a number of navigation operations to find the object on which the task is to be performed.

[0011] For example, if a trader wants to generate and review a two-year price-volume trend analysis and generate a related graph or chart, he may first have to  
20 "click" or navigate a menu structure to find the appropriate program or icon for the analysis task. After invoking the task, he must then select the block of data upon which the analysis is to be run, such as first selecting "DATA" then "IMPORT", and

then navigating to find the appropriate database, setting input filter options, and then completing the data input process. Finally, the trader executes the analysis operation, specifying any options necessary, and gets the results and chart he needs to see.

[0012] This process is cumbersome most times, and can require a significant amount

5 of time to conclude, which is critical during "live" trading sessions. Further, this process requires intimate knowledge of the computer system, where it's programs are located and how they are organized, and where or how to access each data source.

[0013] This "paradigm" of research, data access, and analysis is common to many other professions including purchasing agents, sales professionals, and technical

10 support staff, all of whom find themselves overwhelmed by the amount of information through the Internet, and frustrated by the user interface of browsing, windowing, and program control.

[0014] The related patent application discloses a system and method which reduces the information overload suffered by many professionals in research-intensive fields,

15 and which allows the user to order and arrange the information in a manner which is conducive to his or her specific tasks and activities. Additionally, the invention of the related patent application provides an integrated user interface which enables a user to switch between tasks easily and quickly using an Object-Action Navigation user interface model. This system also allows a user to receive and view retrieved

20 information according to his or her specifically indicated interests, such as keywords, and to receive and review related information in a secondary priority which may also be of interest.

[0015] The related invention employs a plurality of independent modules, each module being responsible for retrieving certain information from certain sources and/or performing certain processing actions on this information.

[0016] However, this advanced information-aggregating web site technology has an essential benefit and a problem that goes along with the benefit. The benefit is that information from varied sources can, with the new technology, be aggregated and presented to the user in a cohesive fashion using these semi-independent information modules.

[0017] Information in these modules can all respond, in an apparently independent but parallel fashion, to system-wide search/filtering/selecting context-setting actions by the user. However, the semi-independent nature of these modules, representing as they do information from varied sources, creates a difficulty: By what simple and constrained mechanism can information about the user's browsing and selecting within each module be reflected back to the system-wide context tools displayed by the browser?

[0018] Forcing the information modules to be completely integrated with all the functions of the aggregating system would negate the flexibility of the aggregated, semi-independent nature of the information modules (e.g. reducing the independence of the modules).

[0019] Therefore, there is a need in the art for a system and method which, cooperative with the invention of the related patent application, provides quick and simple access to information objects encountered while browsing information

displayed on a website. This new system and method should also provide a user with a historical view of previously accessed objects.



## BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The following detailed description when taken in conjunction with the figures presented herein provide a complete disclosure of the invention.

[0021] Figure 1 illustrates the arrangement of systems for researching information  
5 according to the prior art.

[0022] Figure 2 sets forth the arrangement of systems according to the invention of the related patent application.

[0023] Figure 3 shows an example web page user interface having a context pane and a content pane.

10 [0024] Figure 4 illustrates a pop-up information frame for user-selected objects.

[0025] Figure 5 shows an example of a full-page or maximized action module frame.

[0026] Figure 6 demonstrates the expansion and collapsing functionality of context pane's object list.

[0027] Figure 7 shows an example of roll-over pop-up information display.

15 [0028] Figure 8 illustrates the display of available actions for a selected object.

[0029] Figure 9 shows the preferred embodiment of the present invention within a user interface of an Object-Action navigation tool.

[0030] Figure 10 illustrates the ELP display when a user selects an object upon which an action may be taken.

20 [0031] Figure 11 sets forth the communications between the ELP module, the information modules, and the GateKeeper.

[0032] Figure 12 shows the logical processes of the present invention.

## SUMMARY OF THE INVENTION

[0033] The present invention provides an "Ephemeral List" on the user interface of the related invention. The Ephemeral List panel ("ELP") is a temporary "parking space" for objects encountered in information modules. The ELP also represents a history, preferably in the form of a push-down stack, of products and/or objects encountered by the user.

[0034] Objects in the ELP generally behave the same as objects in the Object List with respect to contextual actions and filtering, with the exceptions of the list management actions such as Add and Delete.

10 [0035] According to a preferred embodiment, a user-configurable limit to the number of objects listed (push-down drop-off limit) is provided, as well as a user-selectable option to clear the list.

[0036] There are a couple of methods for information modules to populate the Ephemeral List. First, if an article examined in a headline module references three products, perhaps as tagged in meta-tags recognized by the UI client code, then those products will appear in the ephemeral list panel when the article is opened.

15 [0037] Second, some information modules have a product-finding function, such as a search capability, in which the user is presented an option of selecting (e.g. via checkbox) a number of the objects found by the search to add to the ephemeral list panel. Some information modules may also have a button to add to the entire current Object List, depending on context.

## DETAILED DESCRIPTION OF THE INVENTION

[0038] The present invention is preferably realized in conjunction with and in cooperation with the invention of the related patent application, although it may be utilized in concert with other products and systems having a user interface, such as web browsers. The present invention is especially useful in providing to a user of an Object-Action Navigation tool quick and simple access to information objects encountered while browsing information. The present invention also provides a user with a historical view of previously accessed objects.

[0039] For better understandability of the present invention, the invention of the related patent application is first reviewed and summarized.

[0040] The related system and method provides an integrated approach to the aggregation and management of information from a variety of sources on a single web page. It allows selective "drill-down" by the user to obtain more detailed information, as desired. Because the user interface and operation paradigm matches the user's natural perspective and processes in that it focuses first on information objects and second on tasks to perform on those objects, it is intuitive and efficient to use.

[0041] The related invention comprises a set of cooperating processes running on a "Gatekeeper" server, and a set of client-side methods or programs running in cooperation with a user's web browser software. The client-side programs are preferably realized as JavaScript macros, but can alternatively be implemented using other well-known client-side software technologies (e.g. browser plug-ins, stand alone software, etc.).

[0042] The related invention provides two "panes" within a single view: a Context Pane and a Content Pane. The Context Pane provides a plurality of tools and filter lists, while the Content Pane provides a number of Workspaces. From the Context Pane, an informational object may be selected by a user, and then an available task for that object may be executed (e.g. "Object-action" navigation).

[0043] Semi-independent functionality modules provide information and task results for each Workspace in the Content Pane. The user interface (UI) is managed by the client-side JavaScript macros, each of which updates its respective areas of the user interface such as lists, icons, panes and workspaces.

[0044] The system of the related invention is realized using a centralized processing method on a web server, which accesses a plurality of information sources and enables a number of functionality modules for a given user based on that user's profile and entitlements. The raw and processed information is prepared by the server, and transmitted to the user's web browser as common web page content.

[0045] Selections by the user within the Context Pane to conduct or execute entitled operations and tasks cause client-side macros to execute. Some operations only require local processing, such as the reformatting or sorting of data which is already present on the user's computer. In such a case, the client-side JavaScript performs the action and updates the portion of the display as needed. In other cases, additional information or processing may be needed, such as getting a current quote for a selected financial instrument, in which case the client-side JavaScript will request processing from the Gatekeeper. The Gatekeeper then performs the requested actions

and processing, returning the results and information to the client-side macro,  
followed by the macro performing the display or user interface update.

[0046] This process and method of the related invention allows the user to configure  
the operations and data displayed in the panes to suit his or her goals and objectives,

5 within the limitations of his or her entitlement schema. This arrangement also allows  
the user to be provided with apparently "custom" functionality and user interface while  
not requiring the user's browser computer to be equipped with highly specialized  
software but just a common web browser. Use of "applets", which have inherent  
drawbacks related to installation, setup, security, etc., are avoided in the preferred  
10 embodiment. Further, the invention provides for management of the web  
browser-based user interface that avoids screen "blanking" during updates of  
information.

[0047] In a first aspect of the related invention, an "Object-Action" navigation  
("OAN") model is adopted to replace the traditional "inverted L" navigation model.

15 Our "Object-Action" navigation model is partly based upon the "Combined  
Object-Action Selection" paradigm described by Kelley and Ukelson in 1992.

[0048] Using OAN, users obtain information they need by first addressing their  
attention to the objects of interest, such as listings on a computer screen user interface  
("UI"). Then, the users specify what actions they wish to perform on those objects,

20 such as a trader first selecting a company name from a list of companies on a computer  
screen, then selecting an action to get a quote for the company's stock. In another  
example, a trader may first select a company of interest, and then select an action to

get the latest analyst commentary regarding that company. This approach is opposite in flow of the traditional paradigm, where a trader would first navigate to a web site where the action can be performed, such as navigating to a stock quote service, and then entering a company's ticker symbol to obtain a current stock quote.

5   **[0049]** Figure 1 illustrates the arrangement of systems of the prior art. A user (10), such as a stock trader, uses a PC with a web browser (11) to access a plurality of web servers (100) or "web sites" (13, 14, 15) to obtain various bits of information from datafeeds and databases. Under this tradition model, in order for the user to get a stock quote, read press releases, obtain analyst's reports, and search the web in general  
10 for other possible interesting information about a particular company or financial instrument, the user performs the following actions:

- (a) navigate to a stock quote service home page;
- (b) enter the company's ticker symbol;
- (c) receive the quote and save the data to local storage for later analysis;
- 15 (d) navigate to the company's home page;
- (e) navigate to the company's investor relations page;
- (f) print or save to disk the company's latest press releases;
- (e) navigate to an analyst service home page;
- (f) search for analyst reports from the analysis service;
- 20 (g) save or print the analysts' reports if any are found;
- (i) navigate to a general purpose search engine;
- (j) perform a search on a set of keywords including the company name,

product names, etc.; and

- (k) follow one or more "hits" or returns from the search engine results to review, print and/or save some of the interesting information.

5 [0050] In this process, the user has entered the company's name or ticker symbol at least four times, probably many more, which represents unnecessary repetition of tasks by the user and accounts for considerable time during a normal working day.

Under the OAN paradigm of the present invention, the user must simply:

- 10 (a) select the company of interest from a pre-configured list of companies and financial instruments, which causes the immediate effect of filtering or pre-populating the information modules in the Content Pane according to that selection;
- 15 (b) select "get quote" action, or use "point-and-click" navigation to see the pre-populated "quote" information module;
- (c) select "get company news releases" action, or navigate to the "News Releases" module which has been filtered and sorted according to the selected company object; and
- 20 (d) select "get analyst reports" action, or navigate to the "Analysis Reports" module which has been filtered and sorted according to the selected company object.

[0051] In another aspect of the related invention, a general search on keywords related to the "objects" available to the user is continuously or periodically executed, and the results of this "broader" search are presented in a less conspicuous manner to allow the user to get more information if desired.

5 [0052] Turning to Figure 2, the arrangement of systems of the preferred embodiment of the related invention is shown. The user (10) uses a PC with a web browser (11), which allows the user to access the invention through a well-known environment. The web browser client software proctors direct communications between client-side information modules and their various information sources (100), such as web servers  
10 for datafeeds and databases, supplying conforming search parameters for each source according to the user's selections in the Context Pane. However, according to the preferred embodiment, a single Context selection is sent to a single "Gatekeeper" (20) server process which handles the various transactions and aggregates the returned information (with appropriate timeouts), and which returns the contents for the  
15 various information modules in one or more transactions to the web browser (11).

[0053] The Gatekeeper (20), then, directly polls and searches the set of information resources (100) according to a user profile and user entitlement registry (21). The user profile indicates which sources of information are of interest to the user (e.g. the "objects" of interest), and an user entitlement indicates which "actions" the user is  
20 allowed to perform on those objects based upon his or her service subscription terms. A set of action modules (22) is also available to the gatekeeper (20). For our example



of information management for a financial instrument trader, the action modules may include modules to:

- (a) retrieve and format press releases from company web sites;
- (b) retrieve current quotes;
- 5 (c) retrieve, chart and analyze historical data;
- (d) retrieve analyst commentaries; and
- (e) perform a general search using a list of keywords related to an object.

[0054] A particular trader may or may not be entitled to use all of these action  
10 modules, depending on his or her entitlement registry.

[0055] Upon initialization, the gatekeeper (20) accesses a user's profile and  
entitlement registry, loads the action modules to which the user is entitled, and obtains  
an initial data set from all of the information sources of interest to the user. This initial  
set of information may then be processed according to the loaded action modules, such  
15 as generating up-to-date historical chart.

[0056] Next, the gatekeeper prepares a web page containing this initial information,  
and transmits the page to the user's web browser (11) JavaScripts. As the gatekeeper  
prepares all of it's results and information in a common format such as Hyper Text  
Markup Language (HTML), the user's PC does not need to be equipped with any  
20 special software other than a common web browser software package that supports  
the use of Javascript macros. No applets or local application software are required,  
apart from the web browser.

[0057] Turning to Figure 3, an example initial web page is shown for a trader's user interface, shown on a portion (30) of the user's PC display. The page is divided into two "panes", a Context Pane (32) and a Content Pane (33). The Context Pane (32) contains an expandable and collapsible list of "objects" of interest according to the user's profile. In our trader example, the list of objects may include company names, products, financial instruments, etc.

[0058] The Context Pane (33) contains a number of workspaces within which the results (37a, b, c, e, f) of several action modules are shown. According to the preferred embodiment, multiple workspaces may be organized and managed by the user by presenting a set of virtual folder tabs upon which each tab has a workspace title or name, such as "Market", "Quotes", "Tools & Analytics", "Research" and "Contact" in this example.

[0059] Each action module (or "query servlet") display "frame" (37), or "tool frame", preferably includes a set of icons which allows the display to be minimized, maximized, and contextual help to be invoked, such as the icons in the upper right corners of the action module displays (37) as shown. Further, up/down and right/left scrolling icons may be provided, as well.

[0060] So, the actions modules or "tools" the user may use are represented in a workspace in the Content Pane (33). At a glance, the user can see a useful portion of the information relevant to the objects of interest in several tools at one time. The user may expand or maximize a frame for a particular tool, as desired, and minimize others, in order to manage the display space effectively through the system's use.

[0061] Each icon selection (such as a maximize icon) or object and action selection causes an associated JavaScript macro to execute on the web browser, which may transmit a request and associated parameters as needed to the Gatekeeper system.

The Gatekeeper system receives the request and parameter, performs the associated

5 processing (e.g. search or information retrieval), and returns the results to the

JavaScript in the form of HTML content. The client-side JavaScript then updates the appropriate portions, panes, frames and/or workspaces within the user interface in the web browser.

[0062] The Content Pane (33) also preferably includes a banner or logo area (31)

10 which allows the providing company to show its name and logo to the user.

[0063] Further, the automatic display of the information (e.g. action module frames)

in the Content Pane (33) is filtered and sorted according to the user's interest level in an object. For example, if a user clicked on "IBM" in the object list of the Context

Pane, the results of the news headline information module would be sorted to place

15 those headlines specifically about IBM at the top or head of the results list, and other

headlines regarding related subjects such as computer and technology equities would

be placed towards the end of the results list. In addition, the "Quotes" transactional

information module (which may exist on another workspace tab) may be

pre-populated with all the quote information about "IBM".

20 [0064] According to the user's profile, the filter/sort process on the Gatekeeper can

determine which action modules to load, which objects to place in the Context Pane,

and how to initially display the action module frames in the Content Pane. The profile

can also record the user's deletions of tools, relocation of tools (within a workspace or from one workspace to another), sizing of action module frames in the Content Pane, as well as reorganization of the objects in the Context Pane. This allows users who rely on the system intimately and intensively to tailor the user interface and display space allocation to his or her best advantage.

[0065] Turning our attention to the Context Pane of the related invention, it preferably contains a GeoMap (30), an Object List and an Object Finder. The purpose and use of the Context Pane is to allow the user to examine objects (e.g. companies, financial instruments, geographies, markets, etc.) and, by expressing interest (e.g. selecting) in an object, causing the contents of the action module frames in the Context Pane to be populated or refreshed in information and process results.

[0066] The user is provided with editing capabilities to add or delete objects from the object list, which results in the user's profile on the Gatekeeper being updated accordingly. Similarly, the user is provided controls to categorize or group objects, such as creating a group "Bonds" and placing a number of bond objects within this group. Groups or categories can be expanded or collapsed using icons, such as the right arrow head icon to the left of the group headings "Bonds", "Equities", and "Foreign Exchange" in Figure 3.

[0067] When objects or category headers are selected in the Context Pane, the associated web browser JavaScript macro is executed. If the requested information is already available in the appropriate tool frame in the Content Pane, then the JavaScript macro will simply highlight the information, bring it to the top of the layers and

workspaces in the display, and filter/sort it if necessary. If the information is not currently available locally to the web browser, the JavaScript may contact the Gatekeeper to obtain the information, which after its receipt, will be formatted and displayed in the relevant tool frame(s). This process of updating only the affected tool frames avoids the need to completely reload the web page in the web browser, which results in an undesirable blanking of the browser display during reload.

[0068] Further according to the preferred embodiment of the related invention, the user may use a "control" or "alt" key and click on several objects to select more than one object. This may cause a JavaScript macro to be executed with multiple criteria or parameters, such as a multiple-parameter search or filter.

[0069] In response to receiving a request for information from a client-side JavaScript macro, the Gatekeeper also executes or runs each loaded action module such that the Content Pane may be populated with relevant information regarding the selected object. While action modules are executing and processing, their respective action module frames in the Content Pane may simply say "Loading...." or display an hourglass icon (or similar wait-while-processing icon). When the results are posted to the action module frame, if their length exceeds the display area of the frame, an ellipsis ("...") may be shown to indicate there is more information to be viewed by maximizing the frame or scrolling the frame.

[0070] Turning to Figure 4, an example of a pop-up display (40) is shown which is provided in response to the user selecting (e.g. clicking on) an item within an action

module frame, such as the buy recommendation in action module frame (37e) of this example.

[0071] Further according to the preferred embodiment of the related invention, the selected information can be maximized (50) to consume the full area of the Content

5 Pane, as shown in Figure 5.

[0072] Turning to Figure 6, the object list in the Context Pane (32) can be manipulated and managed by the user by expanding and collapsing each category header so that only the currently interesting objects are listed. For example, during a particular trading session in which equities are active and the foreign exchange markets  
10 are volatile, the user may expand the equities object group and the foreign exchange object group to show all the objects within those groups.

[0073] As shown in Figure 7, the related invention also provides a "roll-over" action which, when the user moves a pointer over an object in the Context pane, causes a long-quote pop-up (70) to be thrown across the screen. Again, under this paradigm,  
15 the roll-over event is detected by a client-side JavaScript, which then displays the long-quote pop-up on top of the two panes. And, if necessary, the JavaScript may contact the Gatekeeper to get details for the pop-up display.

[0074] Turning to Figure 8, the process of selecting an action to perform on an object is illustrated. The action icons, shown here as the right-facing arrow head icon  
20 to the right of objects in the object list of the Context Pane (32), can be selected by the user, which causes a pop-up action list (80) of available actions or tools for that object. The user can then select an action to perform on the object, which causes the

action module to be executed by the Gatekeeper and the appropriate action module frame to be updated or repopulated with information in the Content Pane (33).

According to the preferred embodiment, the action list may be cascading (81), as well, which allows grouping and categorization of related actions.

- 5 [0075] Further according to the preferred embodiment, an object finder (36) is provided for the user to search for objects based upon keywords, which may then be added to the object list if desired.

- [0076] Also according to the preferred embodiment, a GeoMap (30) is displayed somewhere on the web page, which represents a map of the globe with an indication of  
10 night and day across the map. In addition, information about various geographic areas could be displayed, such as which markets are currently open and time-till-opening-bell indicators.

- [0077] The GeoMap is responsive to user clicks within the map over certain regions, which allows the user to indicate geographic filter criteria to be applied during the  
15 filter and sort actions. For example, a user may select the Asia continent in order to filter and sort the bond information displayed in the action module frames.

[0078] The logical process of the related invention includes cooperative actions between the Gatekeeper and the set of JavaScripts running on the client's browser.

- [0079] First, the Gatekeeper system initializes for a particular user by retrieving the  
20 user's profile and entitlement, and the web browser initializes. The action modules to which the user is entitled are then loaded and executed, which causes an initial data and information set to be retrieved from the networked information sources.

[0080] Then, according to the user's profile, an initial web page is generated combining the initial data set and information into the aforementioned two-pane display, including an object list and one or more action module frames in one or more workspaces having an overall layout definition. The information is preferably filtered and sorted according to the user's indicated interests, as previously described. The initial web page is transmitted to the user's web browser, where it is received and displayed by the JavaScripts on the user's PC display in the appropriate panes, frames and workspaces in the web browser window.

[0081] Until the user selects a link (e.g. an icon, object, workspace tab, GeoMap region, item in a action module frame, etc.) in the web browser display, both the Gatekeeper and the client-side JavaScripts wait.

[0082] When the user selects an icon or link in either of the panes, the associated JavaScript macro is executed. In some cases, such as selection of a "maximize display" icon, this may only result in the JavaScript expanding the relevant tool frame to display all information available. In other cases, the user's selection may require additional information from the Gatekeeper, such as selection of a "Get Current Quote" action on an object, which will result in the associated JavaScript requesting a new quote from the Gatekeeper. If a request for processing is sent to the Gatekeeper, the appropriate action module is executed with retrieval or access of any necessary information, and the results are transmitted back to the requesting JavaScript.



[0083] Next, the associated pane, list, and/or tool frame on the web browser display is/are reformatted or updated by the JavaScript to include the up-to-date data or other Gatekeeper results, with any necessary filtering and sorting being done.

[0084] Then, the Gatekeeper and the web browser JavaScript macros again wait for  
5 another user selection of an icon or list item in the displayed web page.

[0085] Now we turn our attention to the ephemeral list panel (500), which is provided within the OAN user interface as shown in Figures 9 and 10. According to the preferred embodiment, the ephemeral list panel ("ELP") (500) is located (at least initially) towards the bottom of the Context Pane (32). However, as the Ephemeral  
10 list is actually another information module, it can be relocated by the user as desired. The top of the ELP may contain a small title, help, and edit and/or clear icons, as well.

[0086] Turning to Figure 10, an illustration of user interface appearance when performing an action on an object in the ELP is given. The action icons, shown here as the right-facing arrow head icon to the right of objects in the object list of the  
15 Context Pane (32), can be selected by the user, which causes a pop-up action list (580) of available actions or tools for that object. The user can then select an action to perform on the object, which causes the action module to be executed by the Gatekeeper and the appropriate action module frame to be updated or repopulated with information in the Content Pane (33). According to the preferred embodiment,  
20 the action list may be cascading (581), as well, which allows grouping and categorization of related actions.

[0087] The ephemeral list panel (500) is a temporary "parking space" for objects encountered while browsing information displayed in the information modules on a website. It also represents a history, preferably in the form of a push-down stack, of products/objects which have been "encountered", viewed or processed.

- 5 [0088] The ephemeral list is the primary mechanism for communication between semi-independent information modules and the contextual search/navigation components of an advanced web site.

[0089] According to the preferred embodiment, keyword-type metatags hidden in the headers of files sent to independent information modules can contain a list of all  
10 the objects covered in the article or page. The ELP module, then, can automatically extract these keywords from the article or web page and add appropriate objects to the ELP display when it is opened or viewed by the user.

[0090] A common taxonomy of object references (ID's) and, optionally, plain text titles is preferably provided between the varied module information sources and the  
15 Gatekeeper. In some industries, this is already in place, such as Bloomberg's coding system for stock and financial instruments.

[0091] The author or online publisher of an article or page source, such as HTML, for the information modules (Gatekeeper, or varied information source) would be aware of a limited number of simple conventions for coding selection links within the  
20 content.

[0092] For example, a transactional information module may allow a user to search for bonds with certain maturity dates. To do so, the following process may be followed:

- (a) the user enters his or her search criteria and selects a "search" or "find" icon;
- (b) the user is presented with a list of "hits" or results;
- (c) the user may select checkboxes for found objects of interest; and
- (d) the underlying HTML code references a JavaScript function in the browser's client software to read the object references (ID's) and add the item(s) to the ELP display, preferably along with plain-text titles, if available.

[0093] According to the preferred embodiment, the application programming interface ("API") of the Ephemeral List is "evolutionary", such that raw HTML content can be received by the module initially without any "knowledge" of the API and no intercommunication capability.

[0094] In a more advanced embodiment, the Gatekeeper process would be modified to use simple search procedures to "screen-scrape" the web page code from the independent source and add the metatags to afford the first level of intercommunication between the semi-independent modules and the ELP module.

[0095] Standard HTML links in the independent HTML content could also be examined to produce listings of apparent objects to append to the content for user

selection. Standard HTML links could also be re-formatted to re-vector the transaction through the Gatekeeper so it can append the appropriate context/filter/search arguments (based on a knowledge base of how different websites format query arguments in URL's) before passing the URL on to the independent information source.

[0096] For example, a semi-independent information module may have a simple list of links to the top 10 search engines, and the user has filtered the aggregated display with the term/object "Photography". The Gatekeeper, then, may reformat the link to a particular search engine, perhaps "BigSearch.com" from the normal address

10 "http://bigsearch.com" to a qualified address, such as  
"http://bigsearch.com/bin/search?p=photography".

[0097] Turning to Figure 11, the intercommunications of the ELP module, the Gatekeeper, and the semi-independent information modules is shown. The GateKeeper (20) to Information Module (22) communications (604) remain

15 unchanged from the embodiment of the invention described in the related patent application, namely web page code such as HTML. Further, the Information Modules (22) are unchanged in functionality, and more specifically, they each are responsible for updating their relative module frames (37a - 37b) as they re-process information and receive additional information from the GateKeeper under user control.

20 [0098] An ELP module (600) is added to the system design, which preferably runs on the client computer and is another JavaScript. It interfaces (600) to the GateKeeper also through common web code portions, such as HTML or the web code

as previously described having special meta-tags inserted into it. This allows the information modules and the ELP to remain independent from each other, though their actions are coordinated through the GateKeeper.

[0099] Turning to Figure 12, the logical process of the invention is shown in more detail, which is partitioned between client-side modules and the GateKeeper program. Upon initialization (1200), the GateKeeper accesses the user registry to determine which information modules are to be loaded on the client, retrieves up-to-date information from the various sources (100), and forwards that information to the information modules to be placed in the initial displays of the module frames (1207) in the various workspaces of the Content Frame. Additionally, the GateKeeper transmits to the ELP module the list of objects as they were configured during the last use of the ELP, which is displayed in the initial state of the ELP (1204).

[0100] Then, all the client-side modules wait (1205 and 1208) for a user action. When the user takes action in the ELP (1211), such as selecting a listed object to get an updated set of information, the action is communicated to the GateKeeper, which then retrieves (1202) the needed information and forwards that to the relevant module(s) so that the module frames may be updated (1209) accordingly. If appropriate, the ELP module may update the ELP display, as well, such as when the user "adds" or "deletes" an object from the ELP. Then, all the modules return to their wait states (1208 and 1205).

[0101] Likewise, when the user takes action in the Context or Content panes (1210), the modules communicate this action to the GateKeeper, which may then retrieve new

information as needed (1203), and forward any new information to the information module(s) so that the module frames can be updated (1209), as well as forward information to the ELP module so that the ELP display can be updated (1206). For example, a user may right-click on a listed item in an information module frame in the Content Pane, and then select the action "Add to Ephemeral List". This action would cause the information module (e.g. JavaScript) responsible for that module frame to send this command to the GateKeeper, followed by the GateKeeper providing the ELP module with the additional HTML to be shown in the ELP display for that added item. Additionally, as the user adds, deletes and otherwise sorts or filters items in any of the information module frames and the ELP display, the GateKeeper can keep track of the state changes so that they can be restored to that state upon initialization (if browsing were immediately terminated following such a change). Then, all the modules return to their wait states (1208 and 1205).

[0102] While certain details of a preferred embodiment have been disclosed, and certain examples have been given to illustrate the invention in a more understandable manner, it will be recognized by those skilled in the art that the spirit and scope of the present invention is not limited to these examples and embodiment details. The invention may be employed for a wide range of information gathering and user interface applications beyond those related to stock and financial market trading, and alternate programming methodologies and user interface techniques may be employed without departing from the spirit and scope of the invention. Therefore, the scope of the present invention should be determined by the following claims.